

What is claimed is:

1. A paste ejection apparatus for ejecting slurry-like paste in which a viscous substance and a filler component are mixed, comprising:

5 a cylinder block being rotatable about a rotational axis by a rotation drive means, and contacting slidably with a seal surface of a seal member through a slide surface orthogonal to the rotational axis;

plural cylinder holes provided in the direction of  
10 the rotational axis of the cylinder block and including opening portions formed at equal intervals on the same circumference of a circle having the rotational axis of the slide surface as a center;

a plunger inserted into each cylinder hole;

15 a plunger drive means reciprocating said plunger in synchronization with the rotation of said cylinder block;

first and second communicating ports provided on the seal surface and communicating with the opening portions of the cylinder holes in the predetermined rotary position of  
20 the cylinder block;

first and second external ports communicating respectively with the first and second communicating ports through the seal member;

a housing portion located on the peripheral side of  
25 the seal surface, closed and surrounded by the seal member and the cylinder block to be a circular ring-shaped space;

and

a ring-shaped external seal member attached into the housing portion, including a first seal material having self-lubrication and a second seal material being rich in elasticity.

2. The paste ejection apparatus according to Claim 1, wherein the housing portion is formed by opposing an outer surface of the seal member to an inner surface extending axially from the cylinder block.

3. The paste ejection apparatus according to Claim 2, wherein the second seal material of the external seal member is fitted onto the outer surface of the seal member, and the first seal member of the external seal member slidably contacts with the inner surface of the cylinder block.

4. The paste ejection apparatus according to Claim 2, wherein the first seal member has a recess portion, and the second seal member is held by the recess portion of the first seal member.

5. The paste ejection apparatus according to Claim 1, wherein the housing portion is formed by opposing an inner surface extending axially from the seal member to an outer surface of cylinder block.

6. The paste ejection apparatus according to Claim 5,  
wherein the first seal member of the external seal member slidably  
contacts with the outer surface of the cylinder block, and  
5 the second seal material of the external seal member is fitted  
onto the inner surface of the seal member.

7. The paste ejection apparatus according to Claim 5,  
wherein the first seal member has a recess portion, and the  
10 second seal member is held by the recess portion of the first  
seal member.

8. A paste ejection apparatus for ejecting slurry-like  
paste in which a viscous substance and a filler component are  
15 mixed, comprising:

a cylinder block being rotatable about a rotational  
axis by a rotation drive means, and contacting slidably with  
a seal surface of a seal member through a slide surface orthogonal  
to the rotational axis;

20 plural cylinder holes provided in the direction of  
the rotational axis of the cylinder block and including opening  
portions formed at equal intervals on the same circumference  
of a circle having the rotational axis of the slide surface  
as a center;

25 a plunger inserted into each cylinder hole;  
a plunger drive means reciprocating said plunger in

synchronization with the rotation of said cylinder block;

first and second communicating ports provided on the seal surface and communicating with the opening portions of the cylinder holes in the predetermined rotary position of the cylinder block;

first and second external ports communicating respectively with the first and second communicating ports through the seal member;

a housing portion located on the peripheral side of the seal surface, closed and surrounded by the seal member and the cylinder block to be a circular ring-shaped space;

a ring-shaped external seal member attached into this housing portion; and

a run-out constraining means for constraining run-out displacement in the diameter direction of the cylinder block near the external seal portion slidably contacts with the cylinder block.

9. The paste ejection apparatus according to Claim 8, wherein the housing portion is formed by opposing an outer surface of the seal member to an inner surface extending axially from said cylinder block;

the inner surface side of the external seal member is fitted onto the outer surface of the seal member; and

the outer surface side of the external seal member slidably contacts with the inner surface of the cylinder block.

10. A paste ejection apparatus for ejecting slurry-like paste in which a viscous substance and a filler component are mixed, comprising:

5 a cylinder block being rotatable about a rotational axis by a rotation drive means, and contacting slidably with a seal surface of a seal member through a slide surface orthogonal to the rotational axis;

plural cylinder holes provided in the direction of  
10 the rotational axis of the cylinder block and including opening portions formed at equal intervals on the same circumference of a circle having the rotational axis of the slide surface as a center;

a plunger inserted into each cylinder hole;

15 a plunger drive means reciprocating said plunger in synchronization with the rotation of said cylinder block;

first and second communicating ports provided on the seal surface and communicating with the opening portions of the cylinder holes in the predetermined rotary position of  
20 the cylinder block; and

first and second external ports communicating respectively with the first and second communicating ports through the seal member;

wherein the plunger drive means includes;

25 a cam portion provided on the rotation drive means side of the cylinder block, and having cylindrical recess

portions formed so that the drive end sides of the plural plungers can enter therein;

a cam groove formed on the inner surface of said cylindrical recess portion and converting the relative rotating  
5 movement for the cam portion of said cylinder block into the reciprocating movement of the plunger in the direction of the rotational axis; and

a cam follower coupled to the drive end side of each of the plural plungers, and rotating and moving into the cam  
10 groove thereby to transmit the reciprocating movement to the plunger.

11. The paste ejection apparatus according to Claim 10, wherein the cam portion is constituted by combining two end  
15 cams each having a cam surface in the direction of the rotational axis in a state where the cam surfaces are opposed to each other.

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